GROWTH CONFIDENCE INTERVAL LOOK-UP TABLE EXPLANATION – 2007
(BASED ON FALL 2006 ASSESSMENT DATA)

A group may meet the growth model performance expectations in a content area in one of two ways:
- ✓ by meeting or exceeding school growth target,
- ✓ by being close enough to the school growth target value that it cannot be confidently determined if they are "truly" below the target

This document explains the second method—commonly called "confidence intervals"—and helps walk the user through the associated "look-up" tables.

Performance varies from year to year for many reasons. Some changes are due to "true" changes in student learning as a result of improvements in teaching or curriculum, for example, while others may be due to factors beyond the control of the school. Most educators are familiar with the "good class/bad class" phenomenon, where changes in the performance of cohorts are simply due to the combination of students in a given class or school in a particular year. This effect is relatively more pronounced in smaller than in larger groups. Members of the New Hampshire Department of Education (NH DOE), along with leaders from approximately 35 other states, believe that when schools are identified for not meeting performance targets, it should not be due to normal variation, and so they have chosen an accountability system that minimizes this possibility.

This expected variation is characterized statistically as sampling variability. Models of sampling variability can be used to create confidence intervals. The U.S. Department of Education has given the NH DOE permission to use a confidence interval of 99% in evaluating school and group performance. The same degree of confidence is used for these growth model decisions. This means groups in New Hampshire will not be considered to have missed the performance targets unless there is less than a 1% chance that their performance differed from the target because of normal variability. In other words, a school will be identified as missing its target only if that decision can be made with 99% confidence. The width of the confidence interval, and therefore the required observed performance necessary for the group to meet AYP requirements, is contingent upon two major factors: the number of students in the group being evaluated (most important) and the growth annual measurable objective (AMO). More details about the actual calculations are found in the last section of this document.

Using the look-up table

If the observed performance (the proportion of students meeting their growth targets) of a group meets or exceeds the required growth target, or growth AMO, the group will meet the growth model requirements and there is no need to use the look-up table. On the other hand, if the observed performance falls below the growth AMO, the performance of the group (number of students meeting their growth targets) is evaluated to determine whether it is confidently different from the growth AMO, or if it falls within the confidence interval. The accompanying look-up table is designed to help school

personnel apply confidence intervals without having to perform the statistical calculations.

To use the look-up table, first determine the total number of students in the subgroup of interest. Find this number in the column labeled "Nd" (number of students in the denominator). Next, look across the table to the "Nn" (number of students in the numerator) column. This number represents the minimum number of students necessary to meet the growth AMO when the confidence interval is applied. If the number of students meeting their growth target for the particular group exceeds the value in the table, the group will be considered to have met growth requirements for this year for the given subject area.

Example
Assume an elementary school has 14 students in the economically disadvantaged group. The first step is to scan down the fifth (Nd) column to the number 14. Then scan to the right to find the minimum number of students that must meet their growth targets (Nn) for mathematics (3). This process will need to be repeated for reading. The percentages of students required for reading (57) and mathematics (53) without a confidence interval are in the third column (Growth AMO). "EM" refers to elementary middle school.

New Hampshire 2006–2007
Growth Confidence Interval Lookup Table

Subject	Year	Growth AMO	Grade	Nd	Nn
Math	0607	53	EM	11	2
Math	0607	53	EM	12	2
Math	0607	53	EM	13	3
Math	0607	53	EM	14	3
Math	0607	53	EM	15	4
Math	0607	53	EM	16	4

Calculating the minimum number of proficient students for a 99% confidence interval

This calculation is based on the binomial distribution. Each calculation depends on two variables: a growth score, *p*, and a group size, *n*. The growth score for each subgroup is the proportion of students in the subgroup of interest that meet or exceed their growth targets. The minimum number of students, *M*, is defined as

$$M = \min\{\, m: \sum_{i=0}^{m} nCi(p)^i (1-p)^{n-i} \geq .01$$